

**FEDERALLY
ENDANGERED**

Karner Blue

(Lycaeides melissa samuelis)

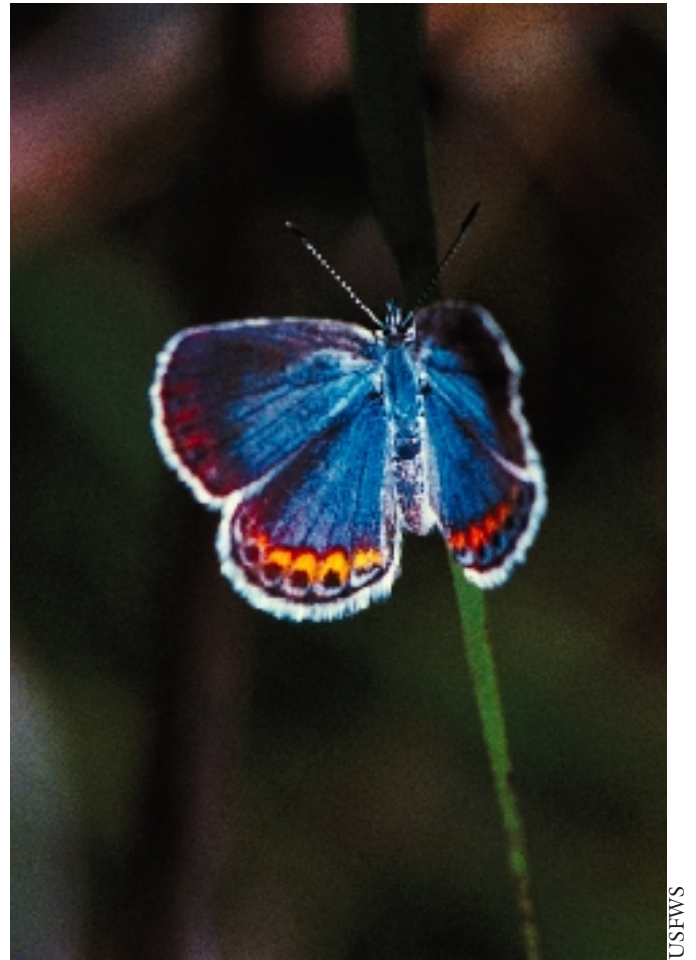
Description

This butterfly is one of the few invertebrates known to be extirpated from Maine. The Karner blue is a small butterfly with a wingspan of just one inch. Males have attractive deep violet-blue wings with bold, black margins fringed in white. Females have dusky brownish-blue wings with irregular bands of orange crescents and metallic spots along the bottom back portion of each wing. The underside of the wings of both sexes is gray to fawn in color with orange crescents and tawny spots near the edges. The caterpillar is green with short pale lines. The Karner blue was first described more than a century ago in Karner, New York.

Range and Habitat

At one time, the Karner blue was found in a nearly continuous band across ten states and one province, from Minnesota and southern Ontario to western Maine. It has since been extirpated from three states, including Maine. It was known to occur only in the Oxford Plains near Norway in western Maine. Today most remaining populations are found in southwestern Michigan and Wisconsin. A small Karner blue population persists near Concord, New Hampshire, and there are several populations in New York.

Within its range, the species is restricted to dry, sandy areas with open woods and clearings supporting wild lupine (*Lupinus perennis*) (this is not the familiar European lupine that has successfully spread throughout Maine). This habitat is usually associated with pitch pine or scrub oak woodlands that are maintained by fire at an early stage of plant succession.



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Life History and Ecology

The Karner blue cannot live without the wild lupine plant. It relies on wild lupines for nearly all of its life stages: egg, larva (caterpillar), pupa (chrysalis), and adult (butterfly). The Karner blue produces two generations each year. The first generation of adults emerges in late May to mid-June. Females lay their eggs on the underside of lupine leaves or stems. The eggs hatch in 7-8 days, and the larva and pupa stages last about 5-6 weeks. The second generation of adults emerges in mid-July to early August. Females of this generation lay their eggs singly on dried lupine seedpods or low on lupine stems. Adults die by the end of August or early September. Winter snows protect the eggs of the second generation until they hatch the following May. Adults feed on nectar from a variety of wildflowers, especially dogbane and New Jersey tea. The Karner blue is found only within the portion of the wild lupine's range where long periods of winter snow occur.

Threats

Because of their reliance on native lupine, populations were extirpated as pitch pine barrens that supported large stands of lupine were lost. Pitch

pine-scrub oak barrens are now a very rare natural community in Maine. Less than half of the historic acreage of pine barrens remains, and is restricted to just seven locations in the southern portion of the state. Habitat alterations from land development, sand and gravel extraction, and timber harvesting have resulted in habitat loss. The pine barrens community requires periodic burns or other disturbances to maintain vegetative structure. Fire suppression policies have resulted in the decreased vigor and extent of this natural community.

Conservation and Management

Karner blues underwent a precipitous decline in population size and distribution during the early 20th century, and were extirpated from Ohio, Pennsylvania, Maine, and Ontario. In Maine, the butterfly's sole location was also the only known site in the state for the native blue lupine. This extensive pitch pine community was lost to farming, development, pine plantations, and gravel and sand mining in the early 1900s, and the lupine and butterfly were extirpated. The Karner blue shared its habitat with many other rare butterflies and moths, including the persius duskywing and frosted elfin, two other butterflies that are believed to be extirpated in Maine. The Karner blue was listed as a federally endangered species throughout its former range in 1992. Attempts to protect and restore habitat and reintroduce populations of the butterfly are underway at several sites, including New Hampshire.

Recommendations:

- ✓ Prior to land development or forest harvesting, consult with a biologist from MDIFW or the Maine Natural Areas Program to assist with planning.
- ✓ Municipalities should strive to maintain important pitch pine barrens identified by MDIFW as open space, identify these areas in comprehensive plans, and conserve accordingly.
- ✓ Use voluntary agreements, conservation easements, conservation tax abatements and incentives, and acquisition to protect important habitat for threatened and endangered species.
- ✓ Where possible, expand existing public and conservation ownership of pine barren acreage to conserve large, contiguous blocks of habitat with a mix of young and old stands.
- ✓ If areas must be developed, minimize footprints of buildings, yards, and roads and landscape with indigenous pine barrens plants. Maintain fuel breaks around homes to minimize danger from wildfire. Compensate loss of pine barrens habitat by creating new pine barrens, restoring degraded habitat, or

placing existing habitat in long-term conservation.

- ✓ Encourage forest management plans that perpetuate pine barrens. Avoid plantations and site conversion, and encourage native species, particularly pitch pine.
- ✓ Consider controlled burning, mowing, and mechanical vegetation management to create a mix of young and mature pitch pine and scrub oak stands.
- ✓ Limit commercial extraction of gravel and sand in pine barrens. Restore old gravel pits and agricultural fields to pitch pine habitat.
- ✓ Apply ¼ mile wide spray buffers around sections of pine barrens hosting rare and endangered species when spraying insecticides for control of gypsy moths and other pests. 🐛